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IDENTIFICATION OF SELECTED FEDERAL ACTIVITIES DIRECTED TO CHEMICALS OF NEAR-TERM CONCERN

ENVIRONMENTAL PROTECTION AGENCY

JULY 1976

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This Report is intended to assist Federal agencies and other interested organizations obtain current information on the on-going activities of EPA directed to selected chemicals of near-term concern. In addition to identifying the principal EPA programs related to these chemicals, the Report also includes significant activities of other organizations when that information is available.

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IDENTIFICATION OF SELECTED FEDERAL ACTIVITIES DIRECTED TO CHEMICALS OF NEAR-TERM CONCERN (Asbestos, Arsenic, Benzidine, Ethylene Dibromide, Hexachlorobenzene, Hexachlorobutadiene, Polybrominated Biphenyls, Polychlorinated Biphenyls, Vinyl Chloride, Vinylidene Chloride)

Prepared by the

OFFICE OF TOXIC SUBSTANCES

U.S. ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JULY 1976

PREFACE

This Report is intended to assist Federal agencies and other interested organizations obtain current information on the on-going activities of EPA directed to selected chemicals of near-term concern. Subsequent reports will be devoted to other chemicals of interest to the Agency.

In addition to identifying the principal EPA programs relating to these chemicals, the Report also includes significant activities of other organizations when that information is available. The Report does not attempt to include many important completed projects.

The Office of Toxic Substances would welcome information concerning other important on-going activities directed to these chemicals. Such information should be directed to the Chief, Special Chemicals Branch, Office of Toxic Substances.

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ASBESTOS

GENERAL STUDIES

Review of Environmental Effects - A draft report of the effects of asbestos on the environment has been prepared and reviewed by the EPA Science Advisory Board. The report will be completed by the end of 1976. Dr. Gerald Stara, ORD, (513) 684-7407.

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Carcinogenic Potential via Ingestion - Two studies of the oral carcinogenic potential of asbestiform fibers of various types and configurations will begin in September 1976. Each study will use one animal type (rats or hamsters) for the anticipated three-year study period. Tremolite will be the first fiber type administered to test animals. Robert Tardiff, ORD, (513) 684-7213 (EPA participant with NIEHS).

Cellular Transformation - A three-year study to determine if cells in the large intestine of hamsters are transformed as a result of asbestiform fiber ingestion began in the fall of 1975. Robert Tardiff, ORD, (513) 684-7213.

Mutagenesis and Co-Carcinogenesis - A variety of fiber types will be tested in vitro to document mutagenesis and co-carcinogenesis potential. Results are expected by 1979. Robert Tardiff, ORD, (513) 684-7213.

Health Effects of Mine Samples - Asbestos samples from a Minnesota mine will be administered to rats by various exposure routes. Carcinogenicity will be documented, as will effects on organs, especially the lungs and pleura. The three to four-year study has just begun. David Coffin, ORD, (919) 549-8411.

Impact of A/C Pipe - A study of several communities in Connecticut may help determine if the use of asbestos/cement pipe in transporting drinking water has any impact on increased cancer mortality. This study was prompted by the identification of 24 cases of peritoneal mesothelioma. Results are expected by the end of the year. Dr. Gunther Graun, ORD, (513) 684-7217.

Regional Epidemiological Survey - The San Francisco Bay area will be surveyed to determine if patterns of cancer occurrence can be correlated with asbestos in drinking water sources. This two-year project should be reported in early 1978. Lee McCabe, ORD, (513) 684-7211.

Talc Refining - A detailed study has been undertaken in upstate New York to document environmental levels of asbestiform fibers near a talc facility and mortality and morbidity data on workers. John Dement, NIOSH, (513) 684-3191 and H.P. Richardson, MESA, (202) 235-8132.

Study of Workers in Underground Mines - An epidemiology study of workers in underground mines is being conducted. Environmental, mortality, and morbidity data will be collected and correlations sought with mined substances, including asbestos. Data should be reported in mid-1977. John Dement, NIOSH, (513) 684-3191 and H.P. Richardson, MESA, (202) 235-8132.

Impact on Aquatic Species - Bioassay experiments to determine if the asbestos fiber content of Lake Superior water may affect the results of toxicity tests will be completed in 1976. Philip Cook, ORD, (218) 727-6692.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Production and Use Trends - The 1976 report on asbestos mining and use is expected in September. R.A. Clifton, Bureau of Mines, (202) 634-1206.

Materials Balance - A study of the commercial movement of asbestos from mining to disposal should be completed in mid-1977. Robert Carton, OTS, (202) 755-0300.

Leaching from A/C Pipe - The potential for asbestos to leach from asbestos/cement pipe in a variety of circumstances is being studied. The results of this series of six-month tests will be reported in late 1977. Earl McFarren, ORD, (513) 684-7236.

Runoff from Roads - Six sites are being selected for the identification and enumeration of asbestos fibers by type in road dust. Data are expected to be reported in early 1978. Byron Lord, DOT, (202) 426-4980.

National Monitoring Program - Water supplies of selected U.S. cities, effluents from selected mining and manufacturing sites, runoff from selected natural sites, and emissions from selected taconite milling plants will be sampled and analyzed for asbestos fibers. Phase I (water) of the study will be completed by mid-1976. Phase II (air) will be completed by December 1976. Robert Carton, OTS, (202) 755-0300.

Levels in Lake Superior - Levels of asbestos in Lake Superior, rivers emptying into Lake Superior, and water intakes from Lake Superior are being established. Samples were collected in 1974, and a report is due later this year. William Fairless, Region V, (312) 353-8370.

Fugitive Dust Study - A pilot study is being conducted to analyze fugitive dust from asbestos/cement waste piles and milling waste piles. The first phase of this study has been completed, and an expanded study on asbestos/cement wastes is slated for completion later this year. David Oestreich, ORD, (919) 549-8411.

Interim Method for Analysis of Water Samples - An interim method for measurement of asbestos fibers in water is being prepared for promulgation in late 1976. Charles Anderson, ORD, (404) 546-3525.

Rapid Method for Analysis of Fibers in Water - A two-year contract was initiated in 1975 to develop a rapid method for determining asbestos fiber levels in water. The report is due in 1977. Charles Anderson, ORD, (404) 546-3525.

Sample Storage Conditions and Sample Preparation - A study of the changes in asbestos samples resulting from storage conditions and sample preparation is underway. Charles Anderson, ORD, (404) 546-3525.

Evaluation of Electron Microscope Methods for Analysis - An evaluation of electron microscope methods for measurement of airborne asbestos concentrations and the development of an optimal measurement procedure are under study. This activity will be completed in 1977. Jack Wagman, ORD, (919) 549-8411.

Improved Method of Measurement in Air - A method is being refined for the improvement in accuracy of measurements of asbestos fibers in air. Philip Cook, ORD, (218) 727-6692.

Improved Method of Sampling in Stack Gases - The development of an improved sampling method for asbestos fibers in stack gases and a refined analytical method are being developed. This effort should be completed in 1976. Louis Paley, OE, (202) 755-8137.

SUBSTITUTES, CONTROL TECHNOLOGY, AND RELATED COSTS AND ECONOMIC FACTORS

Water Supply Treatment Demonstration Facility - A demonstration facility for full-scale removal of asbestiform fibers is due to be completed in Duluth in early 1977. It will be operated as an experiment for three years. Earl McFarren, ORD, (513) 684-7236.

Pilot Plant Studies - A pilot plant (15-20 gpm) for removal of chrysotile asbestos from water is scheduled to be completed later this year. Testing at this facility will be based on the experiences gained in Duluth. Gary Logsdon, ORD, (513) 684-7228.

Control of Discharges from Solid Wastes - Studies to develop techniques for control of emissions from asbestos-containing waste piles at asbestos/cement pipe manufacturing sites are due to be reported by the end of the year. Mary Stinson, ORD, (201) 548-3414.

Tracer Fibers - A pilot study of incorporating radioactive tritium into asbestiform fibers has been successfully completed. Tritiated chrysotile fibers will be available for research activities by the end of the year. Richard Bull, ORD, (513) 684-7217.

Economic Impact of Controls - The potential economic impact of several possible approaches for controlling asbestos will be studied, beginning later this year. Robert Carton, OTS, (202) 755-0300.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Drinking Water Standard - Asbestos is one of the contaminants being considered in a study by the National Academy of Sciences on the health effects of contaminants in drinking water as a requirement of the Safe Drinking Water Act. The report is due December 15, 1976. Edgar Jeffrey, WSD, (202) 426-8877.

Hazardous Air Pollutant Standard - Iron ore beneficiation plants are being studied to determine the feasibility and desirability of extending coverage of current Hazardous Air Pollutant Standards to this possible source of asbestos. Gilbert Wood, OAQPS, (919) 688-8146 X-295.

Workplace Standard - A downward revision of the workplace exposure limit has been proposed. After economic impact studies are completed and public hearings have been held, the revised standard may be promulgated. William Warren, OSHA, (202) 523-7177.

Workplace Studies - The brake lining and clutch rebuilding industries are being studied to determine the best means for protecting workers. This classification of workers is not presently covered by workplace standards, and recommendations may be sent to OSHA before the end of the year. John Dement, NIOSH, (513) 684-3191.

Mine Safety Standard - The mine safety standards for metal and nonmetal industries, including asbestos, will probably be revised later in 1976. H.P. Richardson, MESA, (202) 235-8307.

ARSENIC

GENERAL STUDIES

Overview of Environmental Considerations - A report has been prepared describing four major areas: industrial sources of arsenic emissions, commercial flow of arsenic trioxide and its derivatives, hazards presented to man and the environment, and preliminar, assessments of possible controls. Robert Carton, OTS, (202) 755-0300.

Review of Literature on Environmental Hazards - The National Academy of Sciences is preparing a critical review of the existing literature on the environmental hazards of arsenic. The report is expected in August 1976. Dr. Orin Stopinski, ORD, (919) 549-8611, X-266.

Environmental Hazard Assessment - A Scientific and Technical Assessment Review of arsenic is being developed. Dr. Orin Stopinski, ORD, (919) 549-8611, X-266.

Review of Arsenical Pesticides - A broad, multidisciplinary in-house review report on arsenical pesticides will be published later in 1976. Dr. Robert Potrepka, ORD, (202) 557-7480.

Review of Arsenical Pesticides - A second internal review of arsenical pesticides will also be released for publication in 1976. Dr. Homer Fairchild, OPP, (202) 557-7725.

Review of Environmental Effects - A literature search is documenting available information on chemical and physical properties, health effects on humans and other organisms, analytical methods, and media distribution of arsenic and its compounds. A draft report has been prepared, and will soon be published. Dr. Gerald Stara, ORD, (513) 684-7407.

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Acute Oral, Dermal, and Intratracheal Toxicity - Studies documenting acute toxicity by several routes of exposure are scheduled to be reported in June 1977. Cacodylic acid, monosodium metharsonate (MSMA), and disodium metharsonate (DSMA) are being used. Weanling and adult rodents will be tested, and the results will be reported for any impact of age or sex on toxicity. Lawrence Hall, ORD, (919) 549-8411.

Subacute Toxicity - The subacute toxicity of cacodylic acid, MSMA, and DSMA will be determined, using 90-day LD_{50} and chronicity factors. Rodents will first be fed pesticide formulations and then pure compounds. The cacodylic acid report is expected by January 1977, and the MSMA/DSMA reports in January 1978. Lawrence Hall, ORD, (919) 549-8411, X-606.

Absorption, Excretion, Distribution, and Metabolism - The absorption, excretion, distribution, and metabolism of cacodylic acid, MSMA, and DSMA will be studied. These results should be available in 1978. Lawrence Hall, ORD, (919) 549-8411, X-606.

Fetotoxicity - An assessment and quantification of fetotoxic effects of cacodylic acid in rats and mice is being made. The report is due in September. Neil Chernoff, ORD, (919) 549-8411, X-327.

Acute Inhalation Toxicity - Inhalation exposures of rats and mice to cacodylic acid, MSMA, and DSMA have been completed, and the acute broncho-pulmonary effects are being evaluated. A full report is expected shortly. James Stevens, ORD, (919) 549-8411, X-233.

Subacute and Chronic Inhalation Toxicity - Evaluations of the subacute and chronic broncho-pulmonary effects of exposure to fractions of acute LC_{50}'s of cacodylic acid, MSMA, and DSMA are scheduled in the future. James Stevens, ORD, (919) 549-8411, X-233.

Arsenic in Drinking Water - The drinking water of a community with a high rate of skin cancer is being analyzed to determine the presence of chemical species of arsenic. A control drinking water supply is also being analyzed. The species of arsenic identified will then be used in animal studies directed to carcinogenic potential. The final report is scheduled for January 1979. Robert Tardiff, ORD, (513) 684-7213.

Epidemiological Studies in Baltimore and Tacoma - Epidemiological studies of individuals living near industrial sources of arsenic in Baltimore, Maryland, and Tacoma, Washington, are being conducted. These are expected to be reported by the end of the year. Robert Carton, OTS, (202) 755-0300.

Study of Children Near Smelters - An epidemiological study of children around twenty-two smelters which discharge arsenic was completed in June 1976. Blood, urine, hair, and dust samples were collected and analyzed. The report is in draft, and will soon be finalized. Carl Hays, ORD, (919) 549-8411, X-674. (In cooperation with CDC)

In-Depth Epidemiological Studies Near Six Smelters - Six smelters will be selected for in-depth epidemiological and monitoring studies. Routes of exposure will be determined for individuals in all age groups. The activity will include 30 to 45 days of environmental monitoring. Warren Gelke, ORD, (919) 549-8411, X-861.

Bioaccumulation Potential - A series of tests is being conducted to determine the bioaccumulation potential of four arsenical compounds (trioxide, pentoxide, sodium methyl arsenate, and dimethyl arsenate) in four aquatic species (snails, Gammarus, rainbow trout, and Daphnia). The final report is due in June 1977. Robert Spehar, ORD, (218) 727-6692.

Transport and Fate - The behavior of arsenic in a terrestrial (grassland and forest floor) and an aquatic (littoral zone of a lake) ecosystem will be documented in a three-year study scheduled for completion in June 1978. Site-specific protocols are due to be developed by May 1977. Robert Van Hook, ORNL, (615) 483-8611, X-36488.

Transport and Fate in River Systems - Studies on the fate and transport of arsenic in river systems will be initiated in October 1976. George Baughman, ORD, (404) 546-3145.

Impact on Agriculture - Ongoing studies address (1) arsenite, MSMA, and cacodylic acid in farm ponds, (2) MSMA and cacodylic acid in vegetation control of forests, and (3) MSMA in soils and crops. Edward Woolsen, USDA, (301) 344-3076.

Ecological Impact of Smelter Emissions - The environmental and ecological impacts of arsenic emissions from smelters are being evaluated. At the same time, the impacts of heavy metal emissions will be analyzed. The report is due in January 1977. Robert Carton, OTS, (202) 755-0300.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Meteorological Modelling - A meteorological modelling study is underway to help determine the ambient air concentration of arsenic released from the Tacoma smelter. The ambient air concentration will be determined from stack emissions and fugitive low level emissions. Kenneth Lepic, Region X, (206) 442-1125.

Measurement Capability - A state-of-the-art assessment of measurement capability for arsenic and its compounds will address techniques for measuring ambient levels, effluents, sediments, and biota. A report is expected later this year. Charles Plost, ORD, (202) 426-2026.

SUBSTITUTES, CONTROL TECHNOLOGY, AND RELATED COSTS AND ECONOMIC FACTORS

Smelter Control Technology and Costs - A review of technology available to give a higher degree of control of arsenic from smelters is underway. Also, the economic impact of implementing this technology will be studied. A report on the control technology is expected by September 1976. A report on the economic impact is due by December 1976. Kenneth Kepic, Region X, (206) 442-1125.

Japanese Emission Control Technology - A study to evaluate emission sources, emissions, and control technology of Japanese smelters with regard to sulfur oxides, particulates, and trace elements will start soon. A final report is expected by January 1977. Conrad Kleveno, OIA, (202) 755-0533.

Electrostatic Precipitator Applications - A design manual will be developed for ESP applications in non-ferrous industries. It will include evaluations of ESP performance in at least three copper smelters, two zinc smelters, and one lead smelter. Sampling and analysis for trace metal constituents will be conducted at the same time. Margaret Stasikowski, ORD, (513) 684-4491.

Leaching and Fixation Techniques - A grant has been awarded to Montana Tech Foundation Mineral Research Center to develop a number of leaching and fixation techniques for arsenic-bearing solid wastes from smelters. Margaret Stasikowski, ORD, (513) 684-4491.

Disposal of Arsenic-Bearing Wastes - A laboratory study will determine the effectiveness of fixation processes on arsenic-bearing wastes. Donald Sanning, ORD, (513) 684-7871.

Waste Disposal Technology - A review of waste disposal technology has been conducted. Guidelines may be issued in the future. Fred Lindsey, OSWMP, (202) 755-9206.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Review of Arsenical Pesticides - Arsenic is a candidate for rebuttable presumption proceeding under Section 3 of FIFRA. A determination under this proceeding will be made by May 1977. Ronald Dreer, OPP, (202) 755-5687.

Interim Drinking Water Standards - A maximum permissible concentration of 0.05 mg/l for arsenic in drinking water has been promulgated. This concentration is currently being reviewed in connection with the development of additional standards in 1977. Joseph Cotruvo, OWS, (202) 755-5643.

Water Quality Criteria - A concentration of 50 ug/l has been proposed for total arsenic as a water quality criterion. David Critchfield, OWPS, (202) 245-3042.

Effluent Guidelines - The revision of best available technology limitations will include considerations of arsenic. A broad examination is being directed to the best approach for controlling arsenic. Guidelines for some industrial categories can be expected within the next three years. Ernst Hall, OWPS, (202) 426-2576.

Hazardous Material Spills - Arsenic is included in the preliminary listing of hazardous chemicals under Section 311 of FWPCA. Mandatory reporting of any spill and clean-up and civil penalties are contemplated. Promulgation of the final regulation is being considered for late 1976. Allen Jennings, OWPS, (202) 245-0607.

Air Pollution Assessment - An assessment of arsenic as an air contaminant will include a summary of the analysis of the National Air Sampling Network samples and other air samples around nine smelters. A final report is due in mid-1976. Josephine Cooper, OAQPS, (919) 688-8146, X-501.

New Source Performance Standards - Arsenic data are being collected from process sources at primary cooper, zinc, and lead smelters. Whether standards are set under Section 111 of the Clean Air Act is contingent on these data and the air pollution assessment. The overall study will take two years. Allen Vervaert, OAQPS, (919) 549-8411, X-301.

Workplace Standards - Revised arsenic workplace standards were proposed in January 1975. The final review of the inflationary impact statement is being completed. After this review and hearings, the final standard may be promulgated. Gerald Weinstein, OSHA, (202) 523-7186.

BENZIDINE

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Carcinogenic Potential at Low Dose Levels - Animal feeding studies, together with metabolism studies, are underway at the National Center for Toxicological Research. These studies are intended to demonstrate improved testing approaches to characterizing carcinogens at low dose levels. William Marcus, OTS, (202) 755-0300.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Monitoring Method Development - Appropriate analytical methods for benzidine will be selected by August 1976. Three EPA laboratories are considering available methods for reliability, detection limits, and feasibility in all media. Initial evaluations were completed in June, and the recommendations will soon follow. John Moran, ORD, (202) 426-2026.

Field Monitoring - Monitoring activities will be considered when an appropriate method is available. Vincent DeCarlo, OTS, (202) 755-6956.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Toxic Effluent Standard - A toxic effluent standard under Section 307(a) of FWPCA was proposed in June 1976, and hearings have begun. Kent Ballentine, OWPS, (202) 245-3030.

Effluent Guidelines - Industrial categories for which effluent guidelines were established under Section 304 of FWPCA will be reviewed to determine the potential for benzidine release in their effluents. Walter Hunt, OWPS, (202) 426-2724.

Hazardous Spills - Benzidine is being studied for possible inclusion under the hazardous spill provisions of the Federal Water Pollution Control Act (Sec. 311). Michael Flaherty, OWPS, (202) 245-3047.

ETHYLENE DIBROMIDE

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Health Effects on Workers - Background information is being gathered on residue levels, epidemiology, carcinogenicity, and inhalation toxicity for a report to be completed in 1976. Dr. Roscoe Moore, NIOSH, (301) 443-3843.

Teratogenicity - A laboratory experiment addressed the teratogenic potential to mice via inhalation. Positive results were obtained at 32 ppm. The final report has just become available. William Coniglio, OTS, (202) 755-0300.

Carcinogenicity - Animal inhalation studies began in April 1976. Dr. Cipriano Cueto, NCI, (202) 496-4875.

Monograph on Carcinogenic Risk - The International Agency for Research on Cancer is preparing a monograph on carcinogenic potential with publication estimated for February 1978. Dr. H. Kraybill, NCI, (301) 496-1625.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Vegetation Exposure - Land use patterns and non-point source emissions are being studied in an assessment of the impact of production facilities in Magnolia and El Dorado, Arkansas. A report will be available in mid-1976. In addition, infrared color aerial photos are being taken over El Dorado to obtain indications of vegetation stress that may be resulting from fallout attributable to the plants. The results should be available in early July. Allen Waters, ORD, (703) 347-6224.

Monitoring Near Production Plants - This study will determine ambient air concentrations (if any) in the vicinity of two production plants near Magnolia and El Dorado, Arkansas. Frank Hall, Region VI, (214) 749-3971.

Environmental Levels Associated with Pesticide Usage - This program is developing data on environmental levels near sites where EDB is used as a pesticide. G. Rohwer, USDA, (202) 436-8261 and William Coniglio, OTS, (202) 755-0300.

Environmental Levels Resulting from Use in Gasoline - Environmental levels in air and water are being determined at urban and rural sites to help delineate the zone of impact from suspected sources, e.g., gas stations, vehicular traffic, and storage facilities. Sampling sites are located in Arizona, California, Kansas, New Jersey, and Oklahoma. William Coniglio, OTS, (202) 755-0300.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Review of Registered Pesticides - Registered pesticide uses are being reviewed in connection with possible limitations under the rebuttable presumption procedure. A decision under this procedure is expected in late 1976. H. Hall, OPP, (202) 755-8053.

Air Pollution Assessment - A review of the general literature and modelling of anticipated ambient air levels have been completed. This report will be used as a basis for developing recommendations concerning possible regulatory action. Richard Johnson, OAQPS, (919) 688-8146, X-501.

Criteria Document for Workplace Exposure - A criteria document is scheduled for initiation in early 1977 with a nine-month completion time. Dr. Robert Mason, NIOSH, (513) 684-8209.

HEXACHLOROBENZENE

GENERAL STUDIES

Toxicity and Environmental Exposure - An overview of the hazards, types and levels of exposure, and potential sources is being developed. William Coniglio, OTS, (202) 755-0300.

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Reproduction Study in Rats - A three-generation rat reproduction study to determine the impact of low levels of HCB exposure has been completed. The report will be available in a few weeks. Dr. August Curley, ORD, (919) 549-8411, X-655.

Chronic Effects - A two-year feeding study to establish the types of chronic effects has been completed. Histopathological findings should be available by December 1976. Dr. Harold Smalley, USDA, (713) 846-1371.

Chronic Toxicity in Dogs - A twelve-month dog feeding study will be completed in September 1976. Analyses of blood sera for immunological changes are in process. William Coniglio, OTS, (202) 755-0300.

Carcinogenicity Testing - Two carcinogenicity studies have been undertaken, including determination of the carcinogenicity in animals receiving a vitamin-deficient diet. Dr. S. Charbonneau, Canadian Ministry of Health, (613) 996-3117.

Toxicity Studies on Swine, Dogs, and Poultry - The oral toxicity using multiple exposure levels is being studied to provide information on the impact of residue levels in feed. Gross effects have been noted, as well as the details of histopathology investigations and blood examinations. Dr. Richard Teske, FDA, (202) 344-2556.

Effects on Aquatic Organisms - Acute and chronic toxicity studies of the toxicity of HCB to crayfish and fish as well as accumulation and depuration rates in aquatic organisms have been conducted. The final report has just become available. William Coniglio, OTS, (202) 755-0300.

Accumulation and Excretion in Cattle - The rate of accumulation and excretion in beef cattle is being studied at Louisiana State University. Histopathological evaluations of tissues collected during feeding trials are being completed. Dr. Edwin Goode, USDA, (202) 344-2714.

Toxicity in Fish - Thirty-day bioconcentration tests, as well as toxicity bioassays, have been carried out in selected species of fish. The results should be available in October 1976. Gilman Veith, ORD, (218) 727-6692.

Transport and Fate - The behavior in a terrestrial (grassland and forest floor) and an aquatic (littoral zone of a lake) ecosystem will be documented in a three-year study due to be completed in July 1978. Site-specific protocols are scheduled for development by May 1977. Robert Van Hook, ORNL, (615) 483-8611, X-36488.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Environmental Concentrations Associated with Production Activities - The level of environmental contamination immediately adjacent to production facilities has been determined. Levels in air, water, and soil will be presented in a report that should be completed by August 1976. William Coniglio, OTS, (202) 755-0300.

Levels in Sediments and Fish - Routine monitoring downstream of industrial facilities has identified levels of up to 1.9 ppm in fish and up to 30 ppm in sediments in Michigan. John Hesse, State of Michigan, (517) 343-0927.

Levels in Drinking Water - The National Organics Reconnaissance Survey has found HCB in the ppb range in five of the supplies being monitored. Joseph Cotruvo, OWS, (202) 755-5643.

Levels in Human Tissue - Seventeen hundred human adipose tissue samples are being analyzed for HCB as well as other contaminants. Several new methods (Derivitization Technique, Coulson Technique) are being used to confirm ppb levels measured by an electron capture mode. Dr. Frederick Kutz, OPP, (202) 755-8060.

Levels in Mother's Milk - HCB has been found in more than 70 percent of the mother's milk recently sampled in a nation-wide survey. The mean level was 87 ppb and the maximum 260 ppb. A formal report has not been prepared. Dr. Jack Griffith, OPP, (202) 755-2778.

Occurrence in the Domestic Meat Supply - Measurements are being performed on the domestic and imported meat supply. Periodic reports are issued. Dr. John Spalding, USDA, (202) 447-2807.

Food Contamination - Periodic reports are issued on measurements in routinely collected food samples. Paul Corneliussen, FDA, (202) 245-1152.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Water Quality Criteria - HCB is one of the chlorinated benzene compounds which will be studied to develop a basis for water quality criteria. The report and recommendations are expected in early 1978. John Carroll, OWPS, (202) 245-3042.

Development of Solid Waste Disposal Guidelines - Guidelines for the disposal of HCB are being developed. Studies of volatilization and leaching characteristics are providing part of the basis for the recommendations. John Lehman, OSWMP, (202) 755-9185.

HEXACHLOROBUTADIENE

GENERAL STUDIES

General Literature Review - An overview of low molecular weight haloalkenes, to be completed in November 1976, will include consideration of chemical and physical properties, methods of analysis, sources and background levels, and control technology. Emily Copenhaver, ORNL, (615) 483-8611, X-36823.

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Review of Russian Publications - A literature review has resulted in a compilation of mostly Russian-language articles. Translations have been obtained, and analysis of the information is in process. William Coniglio, OTS, (202) 755-0300.

Environmental Effects - Aquatic ecosystems studies have recently been completed. Mortality, histopathology, uptake, and bioaccumulation were investigated. William Coniglio, OTS, (202) 755-0300.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Industrial Release Potential - Several synthetic organic chemical industries were evaluated for potential release of chemicals into the environment. The report indicates formation of HCBD as a waste from several industries, including perchloroethylene, trichloroethylene, and carbon tetrachloride manufacturing. William Coniglio, OTS, (202) 755-0300.

Monitoring Near Industrial Sites - Monitoring of water, air, sediment, and biota near industrial areas in Michigan has recently been completed. HCBD was detected in several media. John Hesse, Michigan Department of Water Resources, (517) 373-0927.

Levels in Food - Food samples monitored since 1974, indicate the presence of HCBD in a few fish samples taken in the Mississippi River delta. Paul Corneliussen, FDA, (202) 245-1152.

POLYBROMINATED BIPHENYLS

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Health Effects Summary - A summary of current health effects data, including populations exposed and levels of exposure, has just been released. This report is designed to assist regulatory agencies. Dr. Albert Kolby, FDA, (202) 245-1301.

Teratology and Fertility Concerns - The effects on litter size and off-spring of rats are being studied. A report should be available in late 1976. Dr. Elaine Cecil, USDA, (301) 344-2099.

Rat Feeding Study - A rat feeding study, scheduled for completion in August 1976, is examining residue concentrations in various organs and characterizing pathological findings. Dr. Elaine Cecil, USDA, (301) 344-2099.

Single-Dose Investigations in Rats - Adverse effects of single oral doses on rats will be investigated. A report is due in early 1977. Dr. Renate Kimbrough, CDC, (404) 633-3311, X-5235.

Epidemiological Studies - A total of 4,000 persons will be monitored over the next several years to document the effects of human ingestion of these chemicals. Phil Landrigan, CDC, (404) 633-3311, X-3166.

Cattle Studies - A two-year study to document toxicity, distribution, and excretion in cattle was initiated in mid-1975. Dr. Richard Teske, FDA, (301) 344-2556.

Chicken Reproduction - Two studies document the effects of ingestion. The first study focuses on the impacts on feeding, egg production, chicken embryos, chick growth, and chick viability, as well as bioaccumulation in eggs. The second entails pathological examination of the organs of young chickens and hematological tests. Dr. Robert Ringer, Michigan State University, (517) 353-8414.

Egg Production - The effects of exposure on laying hens, including residues in eggs, residue depletion, and hatchability, should be reported within the month. Dr. Elaine Cecil, USDA, (301) 344-3099.

Behavior in Soils - Detailed analyses of leaching, absorption, microbial degradation, and plant uptake in soils will be completed by mid-1977. Dr. Lee Jacobs, Michigan State University, (517) 353-7273.

Degradation Products - The occurrence of furans as a contaminant resulting from PBB degradation is being investigated. A report is due in late 1976. Dr. George Fries, USDA, (301) 344-3076.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Estimation of Exposed Population - Ten thousand individuals have been identified in demographic studies as having been impacted by the Michigan feed contamination incident. Dr. Harold Humphrey, Michigan Department of Public Health, (517) 373-2037.

Exposure Through Milk Consumption - The distribution of milk products from four affected herds was studied to determine the extent of contamination. The results are in preparation. Dr. Mary Zabik, Michigan State University, (517) 353-5251.

Environmental Levels - The Pine River area is being monitored to determine trends in contamination levels. John Hesse, State of Michigan, (517) 343-0927.

Monitoring Methods - Assistance is being provided on methods for identifying sources, techniques for eliminating them, and protocols for analyzing samples. Karl Bremmer, Region V, (312) 353-1459.

Levels in Human Adipose Tissues - Data on levels in adipose tissues are being obtained. Dr. Frederick Kutz, OPP, (202) 755-8060.

SUBSTITUTES, CONTROL TECHNOLOGY, AND RELATED COSTS AND ECONOMIC FACTORS

Effects of Cooking - A study to determine the possibility that cooking will drive PBB's out of chicken meat is in progress. The results are expected within the next month. Dr. Mary Zabik, Michigan State University, (517) 353-5251.

POYLCHLORINATED BIPHENYLS

GENERAL STUDIES

Activities of Government Agencies Regarding Inventories, Substitutes, and Housekeeping - Meetings have been held with senior officials of several Government agencies which (a) own or operate electrical equipment containing PCB's, or (b) are responsible for Governmental procurement of PCB-containing products. These agencies have been urged to provide an inventory of the current Governmental usage of such products and an evaluation of the steps they are taking to (a) introduce substitutes, and (b) reduce PCB discharges into the environment. George Wirth, OTS, (202) 755-6179.

Technical Information Exchange with States - The Governors of the States have been asked to work with EPA in reducing environmental discharges of PCB's. To assist, EPA is developing a technical information exchange program. George Wirth, OTS, (202) 755-6179.

Consultations with OECD on Uses, Labeling, and Reporting - Discussions are continuing with the Organization for Economic Cooperation and Development concerning the efforts of member countries to reduce the need for PCB's. Also of concern is the consistency of labeling and reporting activities directed to PCB's and products containing PCB's. At the most recent meeting in June 1976, recommendations were forwarded to the OECD Environmental Council for consideration at its meeting in July. Jack Thompson, OIA, (202) 755-0430.

Industrial Task Forces on Substitutes and Housekeeping Procedures - Meetings have been held with senior representatives of firms which manufacture PCB's and transformers and capacitors containing PCB's, as well as with railway, transit, and electrical utility organizations. Discussions have considered replacements for PCB's, effluent controls, housekeeping, and other immediate steps to reduce environmental discharges of PCB's. Three industry task forces have completed their tasks and prepared their reports which will be published in August 1976. George Wirth, OTS, (202) 755-6179.

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Health Effects Summary - A summary of current health effects data, including populations exposed and levels of exposure, has just been released. Dr. Albert Kolby, FDA, (202) 245-1301.

Drinking Water Contamination - The National Academy of Sciences has been requested to review the health effects of PCB's in drinking water. The Academy will provide information on the dose-response characteristics of PCB's by December 1976, as a basis for determining whether a standard is appropriate. Edgar Jeffrey, OWS, (202) 426-8877.

Behavior in Soils - A review of existing literature to determine the interactions of PCB's in soils is underway. Also, as an adjunct to previously scheduled investigations of leachates from selected landfills, investigations of possible PCB leakage are being concluded. A preliminary report was published in May 1976. Alan Corson, OSWMP, (202) 755-9187.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Hydraulic and Heat Transfer Fluids - Preliminary assessments indicate that PCB's have been widely used as hydraulic fluids and heat transfer fluids and in other similar applications. An assessment of these uses, including current recycling and reclamation practices, will assist in determining actions needed to curtail significant environmental discharges. These studies are slated for completion in December 1976. Thomas Kopp, OTS, (202) 755-0300.

Investment Casting - An analysis of the use of PCB's in the investment casting industry will help clarify the extent of PCB usage, discharges from users, the industry's dependency on PCB's, and the feasibility of substitutes. Recommendations for follow-up actions will be made. These are expected to be completed in December 1976. Thomas Kopp, OTS, (202) 755-0300.

Pulp and Paper Industry - Based on a preliminary survey of the paper recycling industry, an attempt will be made to assess the scope of environmental problems associated with the occurrence of paper impregnated with PCB's. This task is to be completed in December 1976. Thomas Kopp, OTS, (202) 755-0300.

Inventory of PCB-Containing Carbonless Copy Paper - An inventory of GSA and DSA supply warehouses to determine the quantities of used and unused PCB-contaminated carbonless copy paper is being conducted. Thomas Kopp, OTS, (202) 755-0300.

Contamination of Imported Products - Once an analytical procedure has been identified and standardized, selected imported products will be tested for contamination by PCB's and related materials. John Moran, ORD, (202) 426-2026.

Ambient Levels and Trends - Limited monitoring of air, water, and soil at selected sites is being carried out to document current and ambient levels of PCB's. Monitoring is also conducted near specialized users of PCB's. Preliminary results were correlated and published in May. Vincent DeCarlo, OTS, (202) 755-6956.

Drinking Water Surveys - Drinking water supplies in 122 cities are being surveyed for various organic constituents, including PCB's. The results will be available by February 1977. Edgar Jeffrey, OWS, (202) 426-8877.

Point-Source Information - Additional information concerning the uses and environmental discharges of PCB's from point-sources are being sought from industrial organizations pursuant to Secs. 308 of the Federal Water Pollution Control Act, and 114 of the Clean Air Act. Carl Schafer, OE, (202) 755-0750.

Human Adipose Tissues - PCB's are among the environmental contaminants being measured in the 1700 adipose tissue samples taken from selected cities each year. Annual reports are prepared in June. Dr. Frederick Kutz, EPA/OPP, (202) 755-8060.

Levels in Air - Limited preliminary air monitoring data are being obtained near several facilities. These data will be considered in determining whether a more intensive monitoring effort is in order as a step to determining the desirability, feasibility, and impact of an air standard. Implementation of this effort awaits approval of an interim monitoring method. Mike Jones, OAQPS, (919) 688-8501.

Consultations with Canada on Levels in Great Lakes - Consultations with Canada on the contamination of the fishing resources of the Great Lakes are continuing. The most recent session was held in March. Conrad Kleveno, EPA/OIA, (202) 755-8712.

Analytical Method - Although monitoring has been undertaken, the analytical procedures used have not been standardized. Available methods are being screened for reliability and feasibility, and recommendations will be made for their use in various media. John Moran, ORD, (202) 426-2026.

Predictive Models - Mathematical models to predict environmental distribution, levels, and transport based on release data are being developed. Thomas Kopp, OTS, (202) 755-0300.

SUBSTITUTES, CONTROL TECHNOLOGY, AND RELATED COSTS AND ECONOMIC FACTORS

Solid Waste Management - A continuing program of technical assistance provides guidance to public and private organizations faced with practical disposal problems involving hazardous substances, including PCB's. Advice is available on recycling, burial, incineration, and other possible disposal techniques. Recommended procedures concerning environmentally acceptable waste disposal practices for PCB's and PCB-containing materials were published in the Federal Register on April 1. William Wallace, OSWMP, (202) 755-9190.

Guidelines of the American National Standards Institute - The ANSI Standards on PCB's are designed to improve the handling, maintenance, disposal, and related environmental aspects of PCB's and equipment containing PCB's. EPA is actively participating in the current revision of this standard which should be widely accepted throughout the industrial sector. An initial draft of the revision is in review. Thomas Kopp, OTS, (202) 755-0300.

Incineration of Capacitors - Test burns of PCB-containing capacitors in a high-temperature incinerator were made this spring. By-product formation at various temperatures will be among the factors evaluated in the final report due in August. John Schaum, OSWMP, (202) 755-9200.

Destructive Dechlorination - Several control technologies for removal of PCB's from effluent streams were evaluated. Destructive dechlorination was determined to have the greatest potential utility. A demonstration grant is expected to be made within the next few months to provide working scale application. Paul DesRosiers, ORD, (202) 755-9014.

Replacement Fluids - A continuing assessment of substitutes for PCB's, including development of environmentally acceptable replacement fluids, is necessary as PCB uses are phased-out. A variety of substitutes currently under development are being considered as well as substitutes which might be suggested at a later date. Two requests for an evaluation of possible substitute fluids have resulted in responses published in the June 9 Federal Register. Thomas Kopp, OTS, (202) 755-0300.

Harbor Studies - Studies under Section 115 of the Federal Water Pollution Control Act concerning the removal of in-place pollutants in harbors will give special consideration to PCB's. Kenneth Mackenthun, OWPS, (202) 755-0100.

Lake Contamination - The Clean Lakes program provides a mechanism to encourage States to consider contamination from PCB's and their removal. A letter on this topic was sent to all States in February 1976. Kenneth Mackenthun, OWPS, (202) 755-0100.

Dredging of Sediments - The Corps of Engineers is consulting with EPA on controlling possible transference of PCB's from sediments to the water during dredging operations. Vance Hughes, OWPS, (202) 755-0100.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Water Quality Criteria - A maximum level of 1 ppt in navigable waters has been proposed as a Water Quality Criterion under Sec. 304 of the Federal Water Pollution Control Act. Leonard Guarraia, OWPS, (202) 245-3042.

Toxic Effluent Standard - A national water effluent standard for PCB's under Section 307(a) of the Federal Water Pollution Control Act has been proposed. Pretreatment standards pursuant to Section 307(b) are under study. Kent Ballentine, OWPS, (202) 245-3030.

Effluent Guidelines - The need for and feasibility of PCB effluent guidelines based on Best Practical Technology for those industries involved in the manufacturing of machinery and mechanical products are being studied. If such guidelines are warranted, steps will be initiated in 1976 to develop and incorporate discharge limitations into regulations as appropriate. DeVereaux Barnes, OWPS, (202) 426-2727.

Spill Prevention - Regulations designed to prevent spills of PCB's into navigable waterways will be developed pursuant to Section 311 of the Federal Water Pollution Control Act. The proposed regulations should be ready for publication in late 1976. Henry VanCleave, OWPS, (202) 245-3045.

Drinking Water Standard - If determined appropriate, a drinking water standard will be proposed in early 1977. Charles Hendricks, OWS, (202) 426-8877.

Tolerances in Food - Recent health effects reports are being reviewed to determine if the temporary food tolerance for PCB's should be revised. Dr. Albert Kolby, FDA, (202) 245-1301.

Workplace Criteria Document - A criteria document which will recommend to OSHA an appropriate workplace exposure standard is in preparation. Richard Rhoden, NIOSH, (301) 443-3680.

State Regulatory Actions - Five states have adopted PCB control acts. Others are examining the possibility of establishing pretreatment standards. Thomas Kopp, OTS, (202) 755-0300.

VINYL CHLORIDE

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Carcinogenic Mechanisms - Two studies are being undertaken in an effort to document the mechanism of cancer induction. Joseph McLaughlin, CPSC, (202) 245-1445, and Robert Dixon, NIEHS, (919) 688-8146, X-333.

Epidemiological Investigations in New England - An epidemiological study of the population living near industries using vinyl chloride should be reported in late 1976. George Wirth, OTS, (202) 755-6179.

Epidemiological Investigations in Canada - An epidemiological study is being conducted in Shawinigan, Quebec, which has a high rate of liver cancer and a number of plastics manufacturers and users. Robert McGaughy, ORD, (202) 426-4637.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Residual Unreacted Monomer in Consumer Products - Air samples taken from automobiles, homes, and other sites where PVC materials are used have been analyzed for unreacted monomer. William Coniglio, OTS, (202) 755-0300.

Emissions From Landfills - Landfills where PVC and related wastes are disposed are being monitored for possible emissions. Emery Lazar, OSWMP, (202) 755-9206.

Monitoring of Chemical Landfills - Monitoring of selected chemical landfill sites in New Jersey is in progress. Henry Gluckstern, Region II, (212) 264-4430.

Levels in Food - Food samples are being analyzed with the results expected shortly. Joseph Conrey, USDA, (202) 447-2807.

Migration from PVC Pipe - Studies are being conducted to determine the potential for migration from PVC pipe into drinking water. Preliminary data were reported in January 1976. Joseph Cotruvo, OWS, (202) 755-5643.

Analytical Method Selection - The evaluation of analytical methods for measurements in various media is in progress. Recommendations are expected in August 1976. John Moran, ORD, (202) 426-2026.

SUBSTITUTES, CONTROL TECHNOLOGY, AND RELATED COSTS AND ECONOMIC FACTORS

Solid Waste Disposal Guidelines - Guidelines for disposal of aerosol containers have been prepared and are in the final stages of review. Walter Kovalek, OSWMP, (202) 755-9187.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Air Standard - A National Emission Standard for Hazardous Air Pollutants under Sec. 112 of the Clean Air Act was proposed in December 1975. The final standard has been drafted, and after necessary reviews, should be promulgated in the fall. Susan Wyatt, OAQPS, (919) 688-8146, X-305.

Control of Leaching from Drinking Water Pipes - FDA and EPA are reviewing their authorities which might be used to control leaching from pipes and other equipment used in transporting drinking water. Joseph Cotruvo, OWS, (202) 755-5643.

VINYLIDENE CHLORIDE

HEALTH AND ECOLOGICAL EFFECTS AND ENVIRONMENTAL BEHAVIOR

Inhalation Toxicology in Mice - Inhalation toxicology studies using mice are in progress. Preliminary results have been reviewed, and the final results should be published in late 1976. Dr. Joseph Seifter, OTS, (202) 755-4803.

Inhalation Toxicology in Rats - Industry-sponsored inhalation toxicology studies using rats are expected to be completed in 1976. The studies simulate workplace exposures. Jessie Norris, Dow Chemical Company, (517) 636-1527.

Worker Exposure Incident in New Jersey - A report on medical investigations of workers exposed to VDC will be issued in the fall. Dr. Bobby Craft, NIOSH, (513) 684-2427.

CURRENT AND PROJECTED SOURCES, ENVIRONMENTAL LEVELS, AND EXPOSED POPULATIONS

Analytical Methods - The most feasible methods for analysis in various media are under investigation. Three field laboratories are evaluating the methods and are expected to make recommendations in August 1976. John Moran, ORD, (202) 426-2026.

Monitoring Near Industrial Sites - Monitoring near selected industrial sites will begin as soon as appropriate sampling and analysis techniques have been identified. Perry Brunner, OTS, (202) 755-6956.

Materials Balance Studies - Studies of the flow of VDC through the economy and into the environment are scheduled for the near future. Perry Brunner, OTS, (202) 755-6956.

CONTROL OPTIONS, REGULATORY ACTIONS, AND ATTENDANT IMPACTS

Regulation Under the Clean Air Act - A preliminary air pollution assessment of VDC indicates that regulation under Sections 111 or 112 of the Clean Air Act is not warranted at this time. Robert Kellum, OAQPS, (919) 688-8146, X-501.

Worker Exposure Criteria Document - Development of a criteria document is scheduled to begin in March 1977. Vernon Rose, NIOSH, (301) 443-3680.

Abbreviations of Organizations

Environmental Protection Agency

OAQPS	-	Office of Air Quality Planning & Standards
OE	-	Office of Enforcement
OIA	-	Office of International Activities
OPP	-	Office of Pesticide Programs
ORD	-	Office of Research & Development
OSWMP	-	Office of Solid Waste Management Programs
OTS	-	Office of Toxic Substances
OWPS	-	Office of Water Planning & Standards
OWS	-	Office of Water Supply

Region II	-	Regional Office, New York, New York
Region V	-	Regional Office, Chicago, Illinois
Region VI	-	Regional Office, Dallas, Texas
Region X	-	Regional Office, Seattle, Washington

Other Organizations

CDC	-	Center for Disease Control
DOA	-	Department of Agriculture
DOT	-	Department of Transportation
FDA	-	Food and Drug Administration
MESA	-	Mining Enforcement & Safety Administration
NCI	-	National Cancer Institute
NIEHS	-	National Institute for Environmental Health Sciences
NIOSH	-	National Institute for Occupational Safety and Health
ORNL	-	Oak Ridge National Laboratory
OSHA	-	Occupational Safety & Health Administration